NOTES:
1. CONCRETE GRDE FOR EXTENDED BARRIERS shall be S22 fibre concrete reinforced with 0.5mm single polypropylene fibres at the rate of 0.2% by weight. Steel fibres shall not be permitted as an alternative.
2. Loadbearing Reinforcement, comprising 16mm deformed ribbed bars at 1500mm centres, shall extend for the entire length of the barrier, with 50mm cover at supports. Expansion joints and at ends.
3. OVERCAST JOINTS IN EXTENDED BARRIERS are to be formed by neat saw cutting 50mm deep into the face of the barrier. Time of saw cutting to be determined to avoid shrinkage cracking occurring but must be within 12 hours of emulsion application. Joints are to be at a minimum of 40mm centres.
4. EXPANSION JOINTS IN EXTENDED BARRIERS shall be provided at the end of each 30m section. Barriers without lighting poles shall have expansion joints at 100mm maximum intervals. Expansion joints shall also be provided between the exteded concrete barrier and the barrier terminal.
5. CHAIN LINKS FOR extended barriers shall be 15mm x 15mm.
6. MINIMUM LENGTH OF CONCRETE BARRIER

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<th>MINIMUM BARRENGTH (m)</th>
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7. DOWELS shall comply with AS/NZS 4631 and hot-dipped galvanised to AS/NZS 4680.
8. BRIDGES: extended barriers shall not be used on bridges. Individual assessment by a qualified structural engineer is required for expansion joints where ends of extended concrete barriers abut bridges.
9. HEAVY DUTY PAC CONDUITs to exit extended barriers into structures, prior to barrier terminal, to avoid damaged conduits. Power and communications conduits are to comply with WDSTR.
10. SOLAR BRACKET for details refer to Standard Drawing 1446.
11. BARRIER CENTRELINE to be vertical regardless of crossfall or superstructure.
12. DIMENSIONS ARE in millimetres unless otherwise stated.

**DETAILS**

The default permanent concrete barrier has a containment level rated at TL-5.

A 1300mm high single slope concrete barrier has the following characteristics:

- It is rated at TL-5 when appropriately fixed to ground (pinned or embedded to prevent movement) and can accommodate one 350mm thick pavement.
- After pavement overlays (i.e., more than 35mm increase in height since original installation), the barrier can no longer be considered to be a full TL-5 containment level barrier. It could be expected to have a containment level lower than TL-4.
- Selected containment levels for concrete barrier to determine necessary thickness of barrier may be determined necessary for a site due to any of the following reasons:
  1. Light: distance requirements.
  2. TL-5 containment is not required or demonstrated by site-specific risk assessment.

**CONTAINMENT LEVEL SELECTION**

- Containment level selection cannot be defined prescriptively; rather it is determined using engineering judgement using information obtained from site-specific risk assessments. Refer to Road Planning and Design Manual for guidance on containment level selection for each site.

**DESIGN CONSIDERATIONS**

1. SPECIAL BARRIER DESIGN is required:
   - on curves that have a design speed lower than the design speed on the previous geometric section by 20km/h or more.
   - when designing specifically for commercial vehicles.
   - where major road facility work is likely to be undertaken.
   - For 1500mm high barriers, height shall be at least 1050mm effective barrier height after pavement overlay.

2. Refer to Design Criteria for Bridges and Other Structures for guidance on:
   - Lateral support and dimensional clearances to structures.
   - Ability of material and design to withstand expected loading.

3. Detail to be shown on the drawings:
   - Drainage slot details, if required.
   - Drainage slot centres.
CONCRETE TERMINAL SCHEMATIC

NOTES:

ASSOCIATED DEPARTMENTAL DOCUMENTS:
Standard Drawings Roads Manual
Main Roads Specifications and Technical Standards Manual
Road Planning and Design Manual (RTDM)
Design Criteria for Bridges and Other Structures

REFERENCE DOCUMENTS:

Departmental Standard Drawings:
1466 Concrete Barriers - Deflector Bracket Details
1469 Single Slope Concrete Barrier - Extruded Median Barrier - Details of Road Lighting Pole Cover Plates
1470 Single Slope Concrete Barrier - Transition Between Median Barrier and Thrie Beam Guardrail
1496 Single Slope Concrete Barrier - Concrete Terminal with Thrie Beam Guardrail Connection General Details

Departmental Standard Specifications:
MTR730 Concrete
MTR731 Reinforcing Steel
MTR791 Conduits and Pits

Australian Standards:
AS/NZS 4671: Steel Reinforcing Materials
AS/NZS 4672: Steel Prestressing Material - General Requirements
AS/NZS 4680: Hot-Dip Galvanized (Zinc) Coatings on Fabricated Ferrous Articles
AS 5100 Bridge Design

Other:
NCHRP 350 NCHRP REPORT 350 Recommended Procedures for the Safety Performance Evaluation of Highway Features
MASH Manual for Assessing Safety Hardware

Department of Transport and Main Roads
SINGLE SLOPE CONCRETE BARRIER
EXTRUDED MEDIAN BARRIER, REINFORCING AND EXPANSION JOINT DETAILS
SHEET 2 OF 2